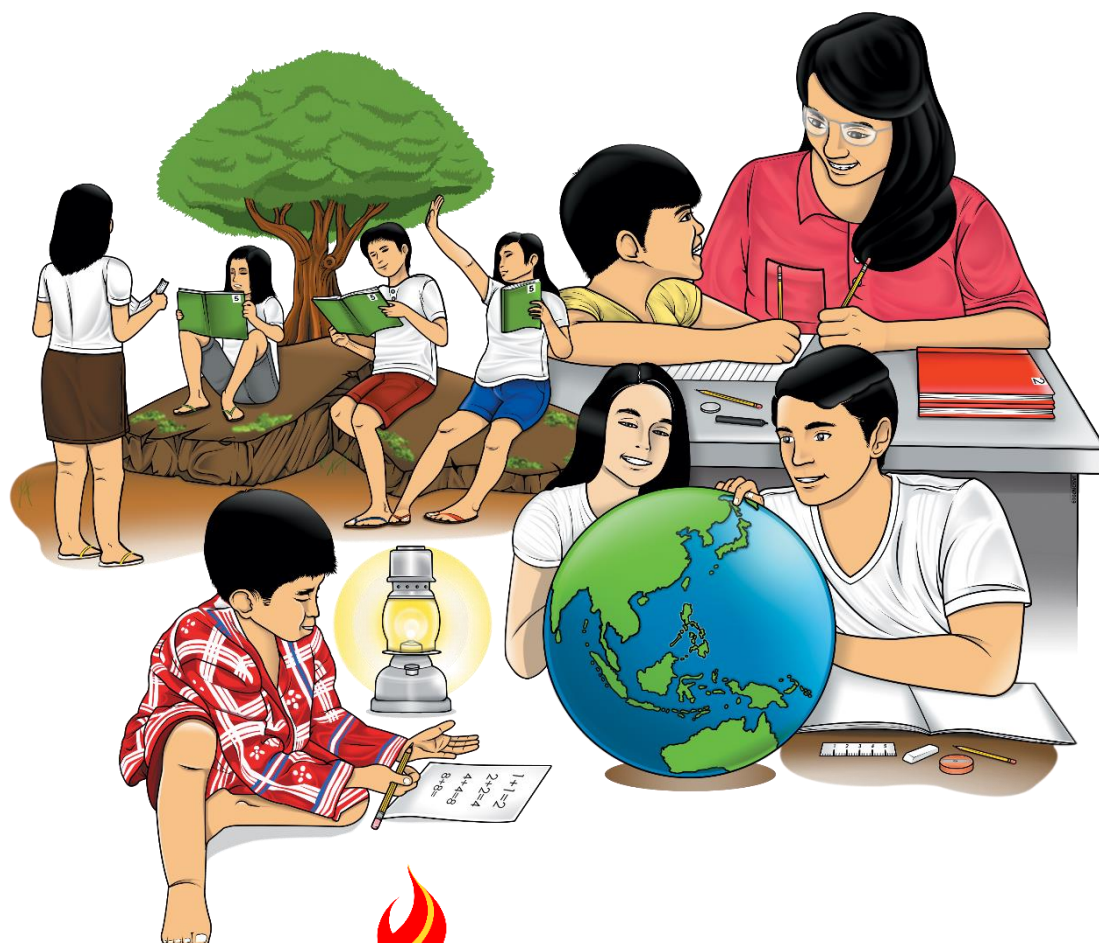


Mathematics

Quarter 4 – Module 17: Analyzing Data Obtained from Chance Using Experiments



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Mathematics – Grade 5

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Quarter 4 – Module 17: Analyzing Data Obtained from Chance Using Experiments
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Mathematics

Quarter 4 – Module 17: Analyzing Data Obtained from Chance Using Experiments

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.



What I Need to Know

Good day Mathletes! This module was designed and written to help you gain understanding and test your ability in analyzing data obtained from chance using experiments involving letter cards (A-Z) and number cards (0 to 20)!

We knew that a probability is a mathematical way of describing how likely it is that something will happen given by favorable outcomes by possible outcomes. A favorable outcome is the outcome of interest or a result we want to happen. An outcome is the result of an experiment. When dealing with probabilities, it is important to be able to identify all the possible outcomes. When the result is what we expected, then it is the favorable outcome. The greater the probability of an event, the more likely it will occur. The smaller the probability of an event, the less likely the probability.

At the end of this module, you are expected to:

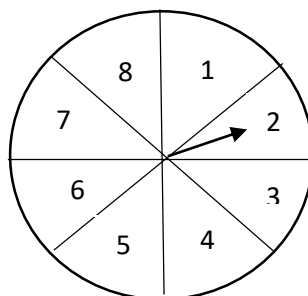
- analyze data obtained from chance using experiments involving letter cards (A-Z) and number cards (0 to 20).
- appreciate the importance of analyzing data obtained from chance using experiments involving letter cards (A-Z) and number cards (0 to 20).

Before going any further, let us check your understanding about analyzing data obtained from chance using experiments involving letter cards (A-Z) and number cards (0 to 20).



What I Know

Directions: Analyze and solve the following problems. Write your answers on a separate sheet of paper.



I. Find the probability of the spinner above stopping on each of the given item.

1. An even number

- (A) $\frac{1}{8}$ (B) $\frac{1}{2}$ (C) $\frac{3}{8}$ (D) 8

2. A three

- (A) $\frac{2}{8}$ (B) $\frac{1}{2}$ (C) $\frac{1}{8}$ (D) 3

3. An odd number

- (A) $\frac{1}{4}$ (B) $\frac{1}{8}$ (C) $\frac{3}{8}$ (D) $\frac{1}{2}$

4. A number less than three

- (A) $\frac{1}{2}$ (B) $\frac{1}{8}$ (C) $\frac{1}{4}$ (D) 3

5. A number less than nine

- (A) $\frac{2}{8}$ (B) $\frac{1}{8}$ (C) $\frac{1}{4}$ (D) 1

II. Each of the 11 letters of the word “MATHEMATICS” is written on a separate card. The cards are placed faced face down and shuffled. A card is chosen at random. What is the probability that it will show each of the following?

1. The letter M

- (A) $\frac{2}{11}$ (B) $\frac{1}{11}$ (C) $\frac{3}{11}$ (D) 2

2. A vowel

- (A) $\frac{2}{11}$ (B) $\frac{1}{11}$ (C) $\frac{4}{11}$ (D) 11

3. The letter E

- (A) $\frac{2}{11}$ (B) $\frac{1}{11}$ (C) $\frac{11}{11}$ (D) 1

4. The letter T

- (A) $\frac{1}{11}$ (B) $\frac{2}{11}$ (C) $\frac{11}{11}$ (D) 8

5. The letter S

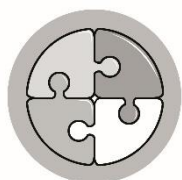
- (A) $\frac{1}{11}$ (B) $\frac{2}{11}$ (C) $\frac{11}{11}$ (D) 8

Lesson

1

Analyzing Data Obtained from Chance Using Experiments Involving Letter Cards (A-Z) and Number Cards (0 to 20)

In order to analyze data obtained from chance using experiments involving letter cards (A-Z) and number cards (0 to 20), you need to master the skills on performing experimental probability, reducing fraction to lowest term, and changing decimal to percent and vice versa because these will help you gain understanding the concept of the lesson. In this module, you will learn how to analyze data obtained from chance using experiments involving letter cards (A-Z) and number cards (0 to 20). Are you ready?



What's In

In the previous lessons, you were able to learn about experimental probability.

Note that, by doing a probability experiment, we can determine that the number of times an event occur. We use a table and record the outcome of probability experiment. The probability can be approximated by the fraction through the number of times an event occurred by number of times the experiment was performed.

Let us refresh your memory and try to answer the following exercises below: The first one is done for you.

Example: If you roll 0-5 number cube, what is the probability that you will roll 7?

The Answer is 0/7.

1. If you roll 0-5 number cube, what is the probability that you will get a number less than 7?
2. From number 1 situation, what is the probability that you will get an even number?
3. From number 1 problem, what is the probability that you will get an odd number?
4. A bag contains 12 apples and 4 oranges. What is the probability of pulling out an apple?
5. In a bag, there are 15 *M and Ms* Chocolate - 4 red, 5 yellow, 3 blue and 3 brown. What is the probability of picking blue *M and Ms*?



What's New

In this lesson, we will deal with concept of analyzing data obtained from chance using experiments involving letter cards (A-Z) and number cards (0 to 20).



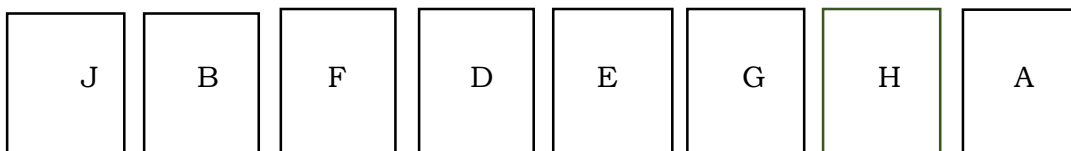
When making important decisions in life, do you list down all the possibilities first before you make a choice, or do you quickly make decisions? Go back to your past experiences and see how much your decisions affected your life.

You will understand this concept as you go along with this module.

Let us study this problem:

PICKING A CARD

Find the probability of picking letter B?



What Is It

A probability is a mathematical way of describing how likely it is that something will happen. An outcome is the result of an experiment. When dealing with probabilities, it is important to identify all the possible outcomes. When the result is what we expected, then it is the favorable outcome. A favorable outcome is the outcome of interest or a result we want to happen. The greater the probability of an event, the more likely it will occur. The smaller the probability of an event, the less likely the probability.

In answering the above problem, we use the formula below:

$$P = \frac{\text{Number of times the event occurred}}{\text{Number of times the experiment was performed}}$$

$$P = \frac{1}{8}$$

B is 1 out of 8, or 1/8

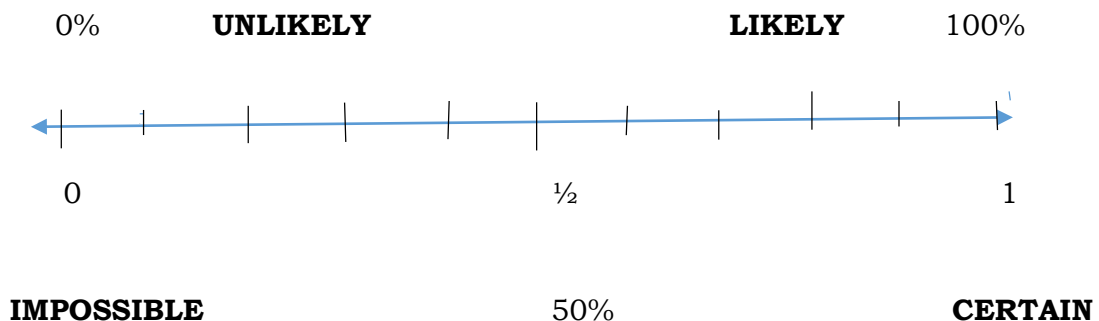
Answer: B is 1 out of 8, therefore the probability of picking B is 1/8.

Example 2: Read and analyze the given situation.

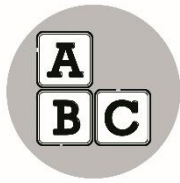
Alphabet cards of the same size and shape were put in a bag, 3 cards have letter M, 4 cards have letter A, 2 cards have letter T and 1 card has letter H.

1. What is the total number of possible outcomes? **Answer:** 10 Cards
2. What is the probability of picking a:
 - a. card with letter M **Answer:** 3/10
 - b. card with letter A **Answer:** 4/10

Let us use the number line to show the probability of an event.



Basing from the number line, we can say that if the probability is less than $\frac{1}{2}$, an event is unlikely to happen. If the probability is more than $\frac{1}{2}$ the event is likely to happen. A probability of 1 means the event will certainly happen and a probability of 0 means it is impossible to happen.



What's More

Activity 1:

Directions: Read and analyze the given situation. Solve for the probability. Alphabet cards of the same size and shape were put in a bag, 3 cards have letter M, 4 cards have letter A, 2 cards have letter T and 1 card has letter H.

1. What is the total number of possible outcomes? _____
2. What is the probability of picking a:
 - a. card with letter M _____
 - b. card with letter A _____
 - c. card with letter T _____
 - d. card with letter H _____
 - e. card with a vowel _____
 - f. card with a consonant _____
 - g. card with M or T _____
 - h. card with letter J _____
 - i. card with T or H _____
 - j. card with letter A or T _____

Activity 2:

Study the cards with letters.



One card is drawn from a well-shuffled 9 letter cards. What is the probability of drawing a card having the following letter/s?

- a. L, O, V, E
- b. M, A, T
- c. I
- d. V, E
- e. Y

Activity 3:

Faye rolls two dice 100 times and records the sum of the numbers on the top faces. The results are shown below.

Rolling Two Dice											
Outcome	2	3	4	5	6	7	8	9	10	11	12
No. of times it happened	2	4	6	8	12	14	17	15	11	9	4

1. Which sum occurred least often?
2. Which sum occurred most often?
3. What is the experimental probability of getting a sum less than 5?



What I Have Learned

A. Fill in the blanks.

1. A _____ is a mathematical way of describing how likely it is that something will happen given.
2. A _____ is the outcome of interest or a result we want to happen.
3. An outcome is the result of an _____.
4. When dealing with probabilities, it is important to be able to identify all the _____.
5. When the result is what we expected, then it is the favorable outcome. The greater the probability of an event, the _____ it will occur. The smaller the probability of an event, the less likely the probability.



What I Can Do

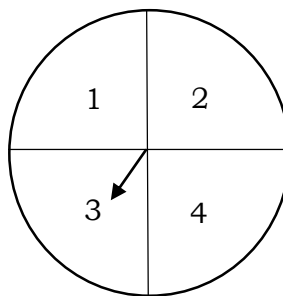
When making important decisions in life, do you list down all the possibilities first before you make a choice, or do you quickly make decisions? Go back to your past experiences and see how much your decisions affected your life.

Directions: Analyze the given data from chance. Answer the following questions.

1. These ten names are written on slips of paper and placed in a box. One name is written at random. Find each probability.

Marissa	Segunda	Alfredo	Roy	Ezekiel
Daniel	Laurence	Vincent	Nandy	Maricel

- a. Drawing a name that begins with the letter A
 - b. Drawing a name that begins with the letter M
 - c. Drawing a name that ends with the letter "I"
2. A spinner is divided into four equal sections numbered 1 through 4. It is spun 100 times. It stopped at section 1 twenty-eight times, section 2 thirty-five times, section 3 twenty-five times and section 4 twelve times.
 - a. Find the probability that section 3 will be spun.
 - b. Find the probability that section 2 will be spun.





Assessment

Directions: Read and analyze carefully each statement below. Choose the letter that corresponds to the best answer. Write the chosen letter on a separate sheet of paper.

- A. A card was drawn 15 times from a deck of 26 letters cards (from A to Z). The table below shows the table of outcomes from the experiment:

K	L	B	T	U
E	A	T	S	I
N	D	K	F	P

1. What is the experimental probability that a consonant is drawn?
(A) $11/15$ (B) $10/15$ (C) $5/15$ (D) $2/15$
 2. What is the experimental probability that a vowel is drawn?
(A) $2/15$ (B) $1/15$ (C) $4/15$ (D) $11/15$
 3. What is the experimental probability that the letter drawn is repeated?
(A) $2/15$ (B) $1/15$ (C) $11/15$ (D) $2/15$
 4. What is the experimental probability that the letter drawn is X?
(A) $2/15$ (B) $10/15$ (C) $3/15$ (D) $0/15$
 5. What is the experimental probability that a letter drawn is K?
(A) $1/15$ (B) $2/15$ (C) $3/15$ (D) $4/15$
- B. Each of the 11 letters of the word “P R O B A B I L I T Y” is written on a separate card. The cards are placed faced face down and shuffled. A card is chosen at random. What is the probability that it will show each of the following?

6. The letter R
(A) $\frac{1}{11}$ (B) $\frac{2}{11}$ (C) $\frac{3}{11}$ (D) 2
7. A vowel
(A) $\frac{2}{11}$ (B) $\frac{3}{11}$ (C) $\frac{4}{11}$ (D) 11
8. The letter B
(A) $\frac{2}{11}$ (B) $\frac{4}{11}$ (C) $\frac{11}{11}$ (D) 1

9. The letter y

(A) $\frac{1}{11}$

(B) $\frac{2}{11}$

(C) $\frac{11}{11}$

(D) 2

10. The letter M

(A) $\frac{0}{11}$

(B) $\frac{2}{11}$

(C) $\frac{4}{11}$

(D) 2



Additional Activities

You made it! Finally, you're on the last activity. Answer it all correctly so you could climb at the top and get your trophy.

Directions: Read and analyze the given problem. Solve for the probability.

1. A bag has 1 blue, 3 green, 2 red and 2 yellow marbles. Find the probability of drawing 3 green marbles?
2. A bag has 1 blue, 3 green, 2 red and 2 yellow marbles. Find the probability of drawing 1 blue marbles?
3. A coin is tossed 80 times. The coin landed on heads 46 times and on tails 34 times. Find the probability on landing on tails.
4. If you are picking a number between 1-20, what is the probability that you will pick an even number?
5. If you are picking a number between 1-20, what is the probability that you will pick number which is a multiple of three?



Answer Key

Assessment

1. A
2. C
3. A
4. D
5. B
6. A
7. C
8. A
9. A
10. A

Additional Activities

1. $\frac{3}{8}$
2. $\frac{1}{8}$
3. $\frac{34}{80}$ or $\frac{17}{40}$
4. $\frac{10}{20}$ or $\frac{1}{2}$
5. $\frac{6}{20}$ or $\frac{3}{5}$

What's In

1. $\frac{5}{7}$
2. $\frac{2}{7}$
3. $\frac{3}{7}$
4. $\frac{3}{4}$
5. $\frac{1}{5}$

What I Have Learned

1. probability
2. favorable outcome
3. experiment
4. possible outcome
5. more likely

What I Know

- I.
1. B
2. C
3. B
4. B
5. A

What I Can Do

1. a. $\frac{1}{10}$ b. $\frac{1}{5}$ c. $\frac{0}{10}$
2. a. $\frac{1}{4}$ b. $\frac{7}{20}$

What's More

Activity 1:

1. 10
2. a. $\frac{3}{10}$ e. $\frac{2}{5}$ i. $\frac{3}{10}$
- b. $\frac{2}{5}$ f. $\frac{3}{5}$ j. $\frac{3}{5}$
- c. $\frac{1}{5}$ g. $\frac{1}{2}$ h. 0.
- d. $\frac{1}{10}$

Activity 2:

- a. $\frac{4}{9}$ b. $\frac{1}{3}$ c. $\frac{1}{9}$ d. $\frac{2}{9}$
- e. $\frac{0}{9}$

Activity 3

1. 2
2. 8
3. $\frac{3}{25}$

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Teacher's Guide Mathematics 5, K-12 Curriculum

Test Item Bank Mathematics 5

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